

REMARKS

By this amendment, Claims 21, 22, 24, 26, 28, 30, 32 and 34 have been amended. No claims have been canceled or added. Hence, Claims 21-34 are pending in this application. All issues raised in the Office Action mailed January 8, 2007 are addressed hereinafter.

CLAIMS 22, 24, 26, 28, 30, 32 and 34 ARE IN PROPER DEPENDENT FORM

Claims 22, 24, 26, 28, 30, 32 and 34 were objected to as being of improper dependent form. No statute or rule was cited for this objection. This objection is respectfully traversed.

Claims 22, 24, 26, 28, 30, 32 and 34 are in proper dependent form because the claims on which they depend cover both hard-wired and software-based implementations of the recited methods. Claims 22, 24, 26, 28, 30, 32 and 34, on the other hand, limit coverage to only software-based implementations (i.e. implementations in which a processor reads and executes instructions from a computer-readable medium). Since Claims 22, 24, 26, 28, 30, 32 and 34 cover only a subset of those implementations covered by the claims on which they depend, they clearly further limit the subject matter of the claim on which they depend and are of proper dependent form.

With respect to this objection, it is recognized that it is uncommon for a dependent claim to have a different form than the claim on which it depends. However, such a practice is explicitly authorized by the MPEP. In fact, many patents have issued with this exact form of dependent claim, including:

6,711,567 Delivering non-default items in association with search results
6,661,877 System and method for providing access to a unified message store logically storing computer telephony messages
6,647,510 Method and apparatus for making available data that was locked by a dead transaction before rolling back the entire dead transaction
6,633,891 Managing replacement of data in a cache on a node based on caches of other nodes

6,631,371 Database fine-grained access control
6,130,677 Interactive computer vision system
6,031,934 Computer vision system for subject characterization

In all of these cases, the USPTO ultimately found the claims to be in proper dependent form. However, due to the uncommon nature of such claims, it was necessary in at least one previous case to set forth a detailed explanation of the propriety of such claims. That argument is reproduced hereafter. It should be noted that the claim at issue in that prior case was a computer-readable storage medium Claim 7 which depended on an independent method Claim 1. Claims 22, 24, 26, 28, 30, 32 and 34 have the identical form of Claim 7, so the explanation provided hereafter applies equally to the present claims 22, 24, 26, 28, 30, 32 and 34.

DETAILED EXPLANATION OF PROPRIETY OF CLAIM

Various tests have been established to determine whether a particular claim qualifies as a proper dependent claim. Significantly, none of the tests requires the dependent claim to fall within the same statutory class as the claim on which it depends. Specifically, MPEP § 608.01(n) states, among other things:

“The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if claim 1 recites a specific product, a claim for the method of making the product of claim 1 in a particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim.”

TEST #1: CLAIM 7 IS PROPER UNDER 35 U.S.C. § 112

35 U.S.C. § 112 is the statutory section that sets for the requirements of a proper dependent claim. In paragraph 4, 35 U.S.C. § 112 states:

Subject to the following paragraph, a claim in dependent form shall **contain a reference to a claim previously set forth** and then **specify a further limitation of the subject matter claimed**. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

The first sentence of this paragraph sets forth the two requirements for a proper dependent claim, and the second sentence sets forth the legal significance to the dependency.

With respect to the requirements, a proper dependent claim must (1) contain a reference to a claim previously set forth, and (2) specify a further limitation on the subject matter claimed. Both of these requirements are clearly satisfied by Claim 7. Specifically, Claim 7 clearly contains a reference to Claim 1. In addition, Claim 7 specifies the further limitation that instructions for performing the method of Claim 1 must be stored on a computer-readable storage medium, so that the method would be performed when one or more processors execute the instructions. Since Claim 1 does not itself require that the method be performed by executing stored instructions, the limitation added by Claim 7 qualifies as a further limitation.

Because Claim 7 is a proper dependent claim, the second sentence of 35 U.S.C. § 112, fourth paragraph indicates that it is to be construed to incorporate by reference all the limitations of the claim to which it refers. Thus, in the present case, Claim 7 is to be construed to incorporate all limitations of the method set forth in Claim 1. That interpretation of Claim 7 is consistent with Applicant's understanding of Claim 7. Specifically, to infringe Claim 7, a computer readable storage medium would have to include instructions for each and every step recited in the parent Claim 1.

TEST #2: CLAIM 7 IS PROPER UNDER 37 C.F.R. § 1.75(c)

37 C.F.R. § 1.75(c) states:

"One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application...."

The test set forth in 37 C.F.R. § 1.75(c) is merely an abbreviated restatement of the test set forth 35 U.S.C. § 112, fourth paragraph. As explained above, Claim 7 refers back to Claim 1, and introduces limitations that are not present in Claim 1. Consequently, Claim 7 satisfies the 37 C.F.R. § 1.75(c) for the same reasons that it satisfies the 35 U.S.C. § 112, fourth paragraph test.

TEST #3: CLAIM 7 IS PROPER UNDER MPEP § 608.01(n)

MPEP § 608.01(n) states:

"the test as to whether a claim is a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112, fourth paragraph) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim."

Unfortunately, the MPEP test involves a circular reasoning, and is therefore less useful than the tests set forth in the relevant statute and rules. Specifically, the MPEP test indicates that incorporation of all of the limitations of the base claim is what determines whether a claim is a dependent claim. However, the statute clearly dictates that, by virtue of a claim being dependent, the claim must be construed to incorporate all of the limitations of the base claim.

However, in spite of the difficulty posed by this circular reasoning, it is respectfully submitted that Claim 7 is also proper under the MPEP test. As mentioned above, it is fully intended that Claim 7 incorporate all of the limitations of Claim 1. In other words, to infringe Claim 7, a computer readable storage medium must include instructions for performing each and every limitation recited in Claim 1.

To the extent that the three tests would yield different results, it is respectfully submitted that the outcome of the test set forth in the statute should govern. However, in the present case, it is respectfully submitted that all tests yield the same results; namely, that Claim 7 is a proper dependent claim. Thus, withdrawal of the 37 C.F.R. § 1.75(c) rejection is respectfully requested.

CLAIMS 21-34 ARE DIRECTED TO STATUTORY SUBJECT MATTER

Claims 21-34 have been rejected under 35 U.S.C. § 101 because the Office Action alleges that the claims do not produce a useful, concrete and tangible result. As amended, Claim 1 recites "... **storing, in a computer-readable medium**, data that indicates which candidate combinations satisfy the frequency criteria associated with said frequent itemset operation." Storing data in a computer-readable medium does produce both a useful and tangible result. Thus Claim 1, as amended, overcomes the rejection.

The Office Action appears to base the rejections to Claims 22, 24, 26, 28, 30, 32 and 34 made under 35 U.S.C. § 101, at least in part, on the rationale that Claims 22, 24, 26, 28, 30, 32 and 34 are directed toward a signal. However, none of the pending claims are directed towards a signal. Instead, Claims 21, 23, 25, 27, 29, 31 and 33 claim a method, and Claims 22, 24, 26, 28, 30, 32 and 34, as amended herein, claim a computer-readable storage medium. A method is a process, and a computer-readable storage medium is an article of manufacture. A process and an article of manufacture are both expressly recognized as being patentable subject matter under 35 U.S.C. § 101.

To be statutory under 35 U.S.C. § 101, the **result** of a claim must be useful, tangible, and concrete. With the exception of the requirement that the **result** of the invention be tangible, Applicants are not aware of any other tangibility requirement relating to 35 U.S.C. § 101.

By this amendment, the computer-readable medium claims 22, 24, 26, 28, 30, 32 and 34 have been amended to recite “computer-readable storage medium.” The Patent Office has issued over 5,000 patents that recite at least one claim directed towards a computer-readable storage medium. For example, issued U.S. Patents 7,065,755, 7,065,740, and 7,065,715 each recite at least one claim directed towards a computer-readable storage medium. Moreover, a computer-readable storage medium is clearly an article of manufacture, which is one of the four statutory categories of patentable subject matter under 35 U.S.C. § 101. The amendments to Claims 22, 24, 26, 28, 30, 32 and 34 are made to clarify that a computer-readable storage medium stores one or more sequences of instructions may be executed by one or more processors of a machine. The amendments to Claims 22, 24, 26, 28, 30, 32 and 34 are not made to disclaim any embodiments where instructions are transmitted or received over a transmission media prior to being stored on the computer-readable storage medium.

For the foregoing reasons, withdrawal of the rejection of Claims 21-34 under 35 U.S.C. § 101 for allegedly being directed to non-statutory subject matter under 35 U.S.C. § 101 is respectfully requested.

THE PENDING CLAIMS ARE PATENTABLE OVER THE CITED ART

As a preliminary matter, it should be noted that the Applicant has already responded to the rejection that has been repeated word-for-word in the present Office Action from the previous Office Action. The present Office Action does not mention or address in any way the explanations given in that response. Therefore, for purposes of completeness, that explanation has been reproduced here from our previous response:

Claims 21-28 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,324,533 (hereinafter *Agrawal*). Claims 29-34 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over *Agrawal* in view of *High Performance Mining of Maximal Frequent Itemsets* (hereinafter *Grahne*). The rejections are respectfully traversed.

Each of the pending claims recites at least one element that is neither disclosed, taught, nor suggested by either *Agrawal* or *Grahne*, taken individually or in combination.

CLAIM 21

Claim 21 recites:

“A method for performing a frequent itemset operation, the method comprising the steps of:
performing the frequent itemset operation in a plurality of phases, wherein each phase is associated with combinations that have a particular number of items;
during at least one phase of the plurality of phases, performing the steps of
determining candidate combinations that are to be evaluated during the phase;
grouping the candidate combinations into clusters, wherein each cluster corresponds to a common combination of items, and wherein all candidate combinations in a given cluster include the common combination of items associated with the cluster; and
processing said candidate combinations, based on said clusters, to determine whether the candidate combinations satisfy a frequency criteria associated with said frequent itemset operation.” (emphasis added)

At least the above-bolded portions of Claim 21 are not disclosed, taught, or suggested by *Agrawal*.

Claim 21 is directed towards an approach for performing a frequent itemset operation. According to the approach of Claim 21, the frequent itemset operation is performed in a plurality of phases. During at least one phase of the plurality of phases, candidate combinations that are to be evaluated are determined, and grouped into clusters. Each cluster corresponds to a common combination of items, and all candidate combinations in a given cluster include the common combination of items associated with the cluster. The candidate combinations are then

processed, based on the clusters, to determine whether the candidate combinations satisfy a frequency criteria associated with the frequent itemset operation.

On the other hand, while *Agrawal* describes an approach for performing a frequent itemset operation, *Agrawal* lacks any teaching or suggestion of anything analogous to a cluster as claimed. As a result, several elements of Claim 21 are not shown by *Agrawal*.

To illustrate, *Agrawal* recites the element of “during at least one phase of the plurality of phases, performing the steps of ... grouping the candidate combinations into clusters, wherein each cluster corresponds to a common combination of items, and wherein all candidate combinations in a given cluster include the common combination of items associated with the cluster.” The portion of *Agrawal* cited to show this element (Col. 5, lines 41-47) merely states, *in toto*:

The candidate generation procedure ensures that C_k is a superset of the set of all frequent k -itemsets. The algorithm builds a specialized hash-tree data structure in memory out of C_k . Data is then scanned in the support counting phase. For each transaction, the algorithm determines which of the candidates in C_k are contained in the transaction using the hash-tree data structure and increments their support count. At the end of the pass, C_k is examined to determine which of the candidates are frequent, yielding F_k . The algorithm terminates when F_k or C_{k+1} becomes empty.

The above-cited portion of *Agrawal* lacks any teaching or suggestion of grouping the candidate combinations into clusters during a phase of a frequent itemset operation. For example, nothing in *Agrawal* is analogous to, during a phase of a frequent itemset operation, grouping candidate combinations in a cluster that corresponds to a common combination of items, and where all candidate combinations in a given cluster include the common combination of items associated with the cluster. At best, the above-portion of *Agrawal* discusses an approach for determining whether a candidate combination meets certain frequency criteria during a phase of a frequent

itemset operation; however, nothing in the above-portion of *Agrawal* suggests grouping candidate combinations into clusters during a phase of a frequent itemset operation. Consequently, the above-bolded element cannot be disclosed, taught, or suggested by *Agrawal*. If the Office disagrees, the Office is respectfully invited to particularly identify which portion of *Agrawal* allegedly is analogous to a cluster as claimed.

As at least one element is not disclosed, taught, or suggested by *Agrawal*, it is respectfully submitted that Claim 21 is patentable over the cited art and is in condition for allowance.

CLAIMS 22-34

Claims 22-34 all depend from Claim 21 and include all of the limitations of the claim from which they depend. It is therefore respectfully submitted that Claims 22-34 are patentable over the cited art for at least the reasons set forth herein with respect to the claim to which they depend. Furthermore, it is respectfully submitted that Claims 22-34 recite additional limitations that independently render them patentable over the cited art, but in view of the fundamental differences over the cited art already identified for each of Claims 22-34, for brevity Applicants reserve the right to discuss those additional limitations at a later time.

CONCLUSION

It is respectfully submitted that all of the pending claims are in condition for allowance and the issuance of a notice of allowance is respectfully requested. If there are any additional charges, please charge them to Deposit Account No. 50-1302.

The Examiner is invited to contact the undersigned by telephone if the Examiner believes that such contact would be helpful in furthering the prosecution of this application.

Respectfully submitted,

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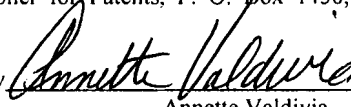
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by



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